CLAIMS

I/WE CLAIM:

1. A monitor for discharging fluids in substantially any direction in substantially a hemisphere from a fixed mount, comprising:

a) a fluid conduit having a base section including a first axis, a midsection, and an exit section;

b) a first joint between said base section and said midsection arranged to allow said midsection to swivel about said first axis; and

c) a second joint between said midsection and said exit section arranged to allow said exit section to swivel about a second axis positioned at an acute angle to said first axis;

d) said exit section having a nozzle including a third axis, said third axis being positioned at an acute angle to said second axis.

2. The monitor of Claim 1, in which said acute angles are substantially 45°.

3. The monitor of Claim1, in whch said acute angles are substantially equal so that said nozzle and said base section can be brought into coaxiality to discharge fluid coaxially of said base section and nozzle.

4. The monitor of Claim 1, in which the swivelable portion of each of said joints is a driven gear, and said monitor further comprises a motor drive with a substantially smaller drive gear, said drive gear directly drivingly engaging said driven gear.

5. The monitor of Claim 4, in which said motor drive is equipped with a brake preventing movement of said drive when said motor is not powered.

6. The monitor of Claim 5, in which said brake is manually releasable.

7. The monitor of Claim 1, in which the swivelable portion of each of said joints is swiveled by a servomotor.

8. The monitor of Claim 7, in which said servomotors are controlled by a microprocessor arranged to swivel one of said joints as a function of the swiveling movement of the other of said joints to maintain said third axis in a plane.

9. The monitor of Claim 1 in which, when said monitor is vertically mounted, said third axis is maintained in a vertical plane during movement from a horizontal to a vertical position by swiveling said joints in accordance with the formulae

$$T = \arccos \{(1/\sin^2 M)*(\cos^2 M - \sin E)\}$$

$$B = \arctan \{\sin T/[\cos M*(1+\cos T)]\}$$

wherein E is the elevation angle of said third axis above the horizontal; M is the inclination of said second axis with respect to said first axis; T is the rotation angle of said second joint required to obtain the elevation angle E; and B is the rotation angle of said first joint required to maintain said third axis in a vertical plane.

10. The monitor of Claim 1, further comprising:

e) an automatic control including a programmed computing means, said computing means being programmed to compute the amount of swiveling rotation of said second joint to obtain a desired elevation angle of said third axis, and the compensatory amount of swiveling rotation of said first joint to maintain said third axis in a constant plane.

11. The monitor of Claim 10, further comprising:

f) an elevation angle input and an azimuth angle input;

g) said computing means generating a first output signal arranged to so swivel said second joint as to produce said elevation angle in said third axis in accordance with the formula

$$T = \arccos \{(1/\sin^2 M)*(\cos^2 M-\sin E)\}$$

wherein E is the elevation angle of said third axis above the horizontal; M is the inclination of said second axis with respect to said first axis; and T is the rotation angle of said second joint required to obtain the elevation angle E; and

h) said computing means further generating a second output signal arranged to so swivel said first joint as to produce said azimuth angle in said third axis in accordance with the formula

$$R = A + \arctan \{\sin T/[\cos M*(1+\cos T)]\}$$

wherein E is the elevation angle of said third axis above the horizontal; M is the inclination of said second axis with respect to said first axis; T is the rotation angle of said second joint required to obtain the elevation angle E; A is the desired azimuth angle; and R is the swiveling rotation of said first joint required to position said third axis at the desired azimuth and elevation angles.

12. The monitor of Claim 10, in which said computing means compute said formulae by digitally accessing a look-up table.